

# Missouri National Recreational River

## Bank Stabilization Information & Standard Permit Conditions

The following conditions are designed to protect the values for which the Missouri National Recreational River was included in the National Wild and Scenic River system. These conditions apply to activities authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. All other federal and state regulations and requirements shall apply to the proposed activity.

The National Park Service (NPS) reviews all US Army Corp of Engineers permit applications within the 59- and 39- mile segments of the Missouri National Recreational River. The NPS is required to review water resource projects, such as bank stabilization, for their impact to the Outstandingly Remarkable Values (ORVs) for which Congress designated segments of the Missouri and Niobrara as Wild and Scenic Rivers. Each project is analyzed for its impacts to the following ORVs:

- Free-flow
- Scenic
- Recreational
- Fish and Wildlife
- Cultural and Ethnographic Resources
- Historic Resources
- Scientific

The NPS reviews each proposed project individually because local site conditions within the designated river reaches vary greatly. Adjacent stabilization, channel conditions, and the potential of the project to cause downstream erosion are all considered.

The NPS promotes the use of 'bioengineering' techniques utilizing native materials for stream bank protection. The NPS encourages those considering a bank stabilization project to request a site visit from our staff **prior to submitting** a permit application to the US Army Corps of Engineers to discuss alternatives and expedite the process. The US Army Corps of Engineers website has more information on the permit application process at:

*[http://www.usace.army.mil/CECW/Pages/reg\\_permit.aspx](http://www.usace.army.mil/CECW/Pages/reg_permit.aspx)*

## STABILIZATION

### I. BIOENGINEERING TECHNIQUES: Permit Required

Refers to the use of biodegradable material on the active streambank to prevent lateral erosion.

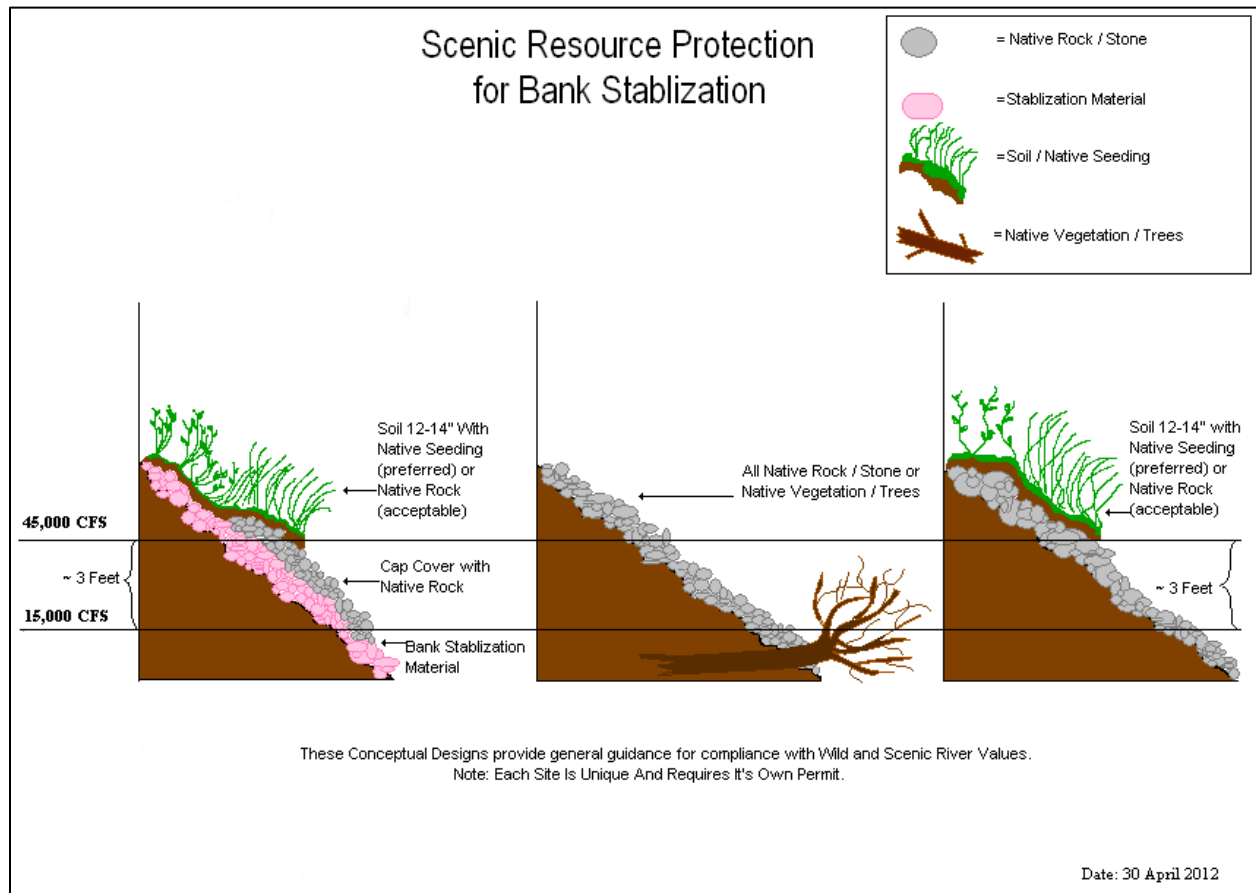
1. Toe protection may include tree revetments, live cribwalls, root wads, live siltation, trench pack, brush mattress, dead fascine, vegetated geogrid, coconut logs, jute-mat logs, or native fieldstone.
2. Plant materials should be native to this area. Native plants are adapted to the soils and weather of this area and should germinate and thrive.
3. All construction materials (e.g., erosion control material, stakes and anchoring systems) shall be biodegradable.
4. A Soil Bioengineering Guide (this document provides information on bioengineering techniques including materials and practices):  
[http://www.fs.fed.us/eng/php/library\\_card.php?p\\_num=FS-683P](http://www.fs.fed.us/eng/php/library_card.php?p_num=FS-683P)

### II. RIPRAP REVETMENT: Permit Required

Refers to the placement of riprap material on the active streambank to prevent lateral erosion.

1. Riprap shall consist of or be covered by fieldstone or native rock. Native rock is defined as any material the river would come into contact with during its natural migration within its floodplain, e.g. rock found along or within the bluffs of the river. The native rock must come from sources within or immediately adjacent to the Missouri National Recreational River. The fieldstone or native rock riprap can be used alone. Quarried pink quartzite shall be covered with native rock or a minimum of 12-14 inches of soil from the top of the structure down to the ordinary high water line. The soil requirement allows for the settling of soil into the rocks while still providing an adequate seed bed. Refer to conceptual design drawing below.
2. All riprap materials used shall be clean and free of concrete, metal, plaster, or other non-native materials.
3. Streambank revetment slope shall be designed to provide stability to the fieldstone; estimated to be one foot in height (rise) over a one-foot length (run) or flatter.
4. The soil shall be seeded with a mixture of native grasses and wildflower species and preferably, incorporate native trees and shrubs. Annual rye grass or other cover crop is recommended to reduce soil erosion and enhance the success of the native plantings. Non-native species such as smooth brome and Kentucky bluegrass shall not be used for this purpose.
5. Soil cover and plantings shall be completed immediately upon completion of revetment.
6. Clearing of on-shore and streambank vegetation shall be limited to that which is absolutely necessary for revetment construction.

7. Recommend that any trees or woody vegetation that is removed during rip-rap installation be replaced with native species and increased in quantity.



### III. BURIED REVETMENT-Permit May Be Required

Refers to the placement of material in a trench excavated near the streambank. The purpose of this structure is to allow the streambank to erode to the buried revetment which then becomes the stabilized bank line.

1. Conditions for the riprap revetment apply to this practice.
2. The bottom of the trench should be located below the elevation of the ordinary high water mark to provide sufficient toe-of-slope protection.
3. Once the buried revetment becomes the newly stabilized bank, the permittee may need to re-seed to ensure that native vegetation cover exists from the top of the structure down to the ordinary high water mark.

IV. HARD POINTS: Permit Required

Refers to a wide range of deflective structures designed to force the river current to a different location. This practice is generally prohibited but may be considered on a case by case basis.

V. WINDROW REVETMENT: **Inappropriate Activity**

Refers to the placement of material on the streambank. The purpose of this structure is to allow the streambank to erode and launch the piled materials into the river with the intent of stabilizing the bank. This practice is inappropriate and generally ineffective.